

## PATENT SPECIFICATION



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## PROVISIONAL SPECIFICATION

## Improved Gas and Liquid Tight Acid Resisting Containers

We, ARTHUR RYNER, Engineer, of 2, Addison Road, London, W.4, of British Nationality, and WALTER HUGH FAWKES, of "The Bingham," Marsham Way, Gerrards Cross, Bucks, of British Nationality, do hereby declare the nature of this invention to be as follows:—

The object of this invention is a gas and liquid tight, acid and alkali proof, unbreakable container for holding gases, liquids, pastes or any other materials, consisting of an outer cover of a substance of sufficient mechanical strength to support the weight and the pressure of the contents and to resist fracture, compression, distortion, collapse, penetration or abrasion such as for instance wood of suitable thickness, plain or corrugated card or fibre board, metal hard rubber, textile fabric, or a combination of these substances, combined and constructed in a shape and manner best suited to the purpose for which the container is intended, and an inner envelop of a flexible, elastic, gas and liquid tight, acid and alkali resisting material such as for instance rubber, rubberised fabric, plastic substance and the like, of a shape and structure approximately and conveniently corresponding to the outer cover but capable of distending, stretching, expanding and adapting itself so as to lie close and conform against the outer cover when filled with the contents whereby the pressure and the weight of the contents are transferred to the outer cover while the inner envelop serves the purpose of making the whole container perfectly air and gas

tight, impermeable to liquid or moisture and acid and alkali proof. The outer cover can be shaped, joined, hinged or made collapsable when the container is empty, so as to take up little space when it is not in use and the inner envelop will fold accordingly, if left in the outer container, or the inner envelop may be extracted and folded separately and replaced when necessary. The inner envelope can be provided with suitable orifices for filling and these may be shaped, creased so that the orifices can be tied up or otherwise closed to become air and gas tight or these orifices may be fitted with stoppers of cork, rubber or other suitable material. The inner envelope may also have one or more suitable discharge openings and these also may be fitted with closing devices, such as rubber tubes, metal or wood taps for releasing measured quantities of the contents and these filling and discharge devices may project through the outer cover to permit filling and discharging without removing the inner envelope.

Such containers would take the place of carboys, bottles, jars, drums, barrels which are breakable, unwieldy and heavy they would be cheaper and simpler to use, simple to store or transport when empty and they would be acid resisting, gas tight, and prevent the contamination of the contents with rust or metal taste especially when used in place of metal lined cases.

Dated the 15th February, 1940.

ARTHUR RYNER.  
W. H. FAWKES.

## COMPLETE SPECIFICATION

## Improvements in or relating to Flexible Containers

We, ARTHUR RYNER, of 2, Addison Road, London, W.4, British Nationality, and WALTER HUGH FAWKES, of "The Bingham," Marsham Way, Gerrards Cross, Buckinghamshire, British Nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by

the following statement:—

This invention comprises improvements in or relating to flexible containers for liquids, gases and undivided fluid masses such as pastes or fluid jelly-like substances, and is concerned with containers of the kind wherein the contents are received in a flexible envelope of elastic liquid-tight material which is inserted

[Price .

into an outer cover and is adapted when filled to lie closely against and conform with said outer cover so as to be supported thereby.

5 By making the inner envelope of containers of the above kind (hereinafter referred to as containers of the kind described) of elastic material, such as rubber, the containers can be rendered acid  
10 and alkali resistant and thus advantageous for replacing the well-known glass or glazed-earthenware vessels. The fact that the inner envelope may inherently possess insufficient mechanical strength to  
15 support the weight and pressure of the contents and may be of material which is liable to damage by tearing or puncture, presents no disadvantage as it is adequately supported and protected by the  
20 outer cover so that it is sufficiently strong and the containers are generally leakproof.

Containers of the kind described have had an outer cover of comparative rigidity  
25 which has placed limitations on them on account of the empty containers taking up an undue amount of space when they are required to be transported or stored in suitable numbers and this leads to difficulties from the point of view of economy in  
30 transport charges, particularly when empties are required to be returned, and from the point of view of economy in packing and storing the articles when not  
35 in use.

Containers of the kind described may of course be used for receiving other substances than acids and alkalies and an important object of the present invention  
40 is to provide an improved construction of container which will be capable of use for receiving liquids, gases and undivided fluid masses generally and capable of transport and storage without the disadvantages described while at the same time  
45 possessing advantages appertaining to the known containers.

According to this invention, a container suitable for liquids, gases and undivided fluid masses, comprises an outer  
50 cover and an elastic liquid-tight inner envelope inserted into the outer cover and adapted when filled to lie against and conform with said outer cover so as to be supported thereby, the said inner envelope  
55 and outer cover both being constructed so that they can be folded to a flat and collapsed condition. Such containers have the advantage that when collapsed and  
60 folded flat they take up comparatively little space and are thus capable of being readily transported and stored in the empty condition.

For instance, the outer cover may be of  
65 the nature of a box or carton made up of

black material which is creased or scored to enable the box or carton to be extended to an erected condition or to be folded to a flat and collapsed condition. Or the outer cover may be made from several separate  
70 parts which are hingedly connected together for erection and collapsing. On the other hand, the inner flexible envelope may conveniently have the form of a bladder of rubber or like elastic material  
75 which is creased, or made from parts flexibly or hingedly connected together, to enable it to fold automatically to a flat and collapsed condition similarly to a football bladder.  
80

According to another feature of the invention, the inner envelope is adapted to be closed independently of the outer cover after filling the container. Thus, the inner envelope may have a flexible filling  
85 tube, like the inflating tube of a football bladder, for filling purposes and this flexible tube be tied for example in a knot in order to close the envelope. By making the inner envelope independently closable,  
90 it is not necessary to attach it to the outer cover at a closure orifice of the latter as in some earlier proposals and provide for tight jointing at this closure orifice. On the contrary, the inner envelope and outer  
95 cover though contained the one within the other, can be otherwise quite disconnected so that each can be handled separately which is of advantage from the point of view of re-use or replacement.  
100 Thus the inner envelope can be filled independently of and then slipped into the outer cover or it can be slipped out of the outer cover when filled for purposes of facilitating discharge of its contents.  
105 From a practical point of view this is very advantageous because only such number of outer covers need be handled and stacked as are required to afford protection and support to the inner envelope  
110 during transit or storage of the goods in the latter. Moreover, it is possible to empty the inner envelope by compressing it so that sometimes it can be discharged without lifting the container. Also the  
115 outer cover can be opened without causing any of the contents of the inner envelope to be exposed or to escape.

In practice, the outer cover may be constructed of any suitable comparatively  
120 rigid substance of sufficient mechanical strength to support the weight and pressure of the contents of the container and to resist fracture under compression or distortion, premature collapse, or penetration or abrasion such as, for example,  
125 wood of suitable thickness, plain or corrugated card or fibre board, metal, hard rubber, or a combination of these substances, constructed or combined in a  
130

shape or manner best suited to the purpose for which the container is intended. Similarly the inner envelope may be constructed of any suitable elastic, gas and liquid tight, and, if necessary, acid or alkali resisting, material such as, rubber of a shape and structure approximately and conveniently corresponding to the outer cover but capable of distending, stretching, expanding or otherwise adapting itself so as to lie against and conform with the outer cover when filled, so that the pressure and the weight of the contents are transferred to the outer cover while the whole container is rendered perfectly air and gas tight, impermeable to liquid or moisture or acid or alkali proof.

The inner envelope may be left in the outer cover and fold with it or it may be extracted and folded separately and replaced when necessary. Obviously, in accordance with the invention, the inner envelope may be provided with any suitable orifices or connections for filling purposes and these may be shaped or creased so that they can be tied up or otherwise closed to become air and gas or liquid tight, or these orifices or connections may be fitted with stoppers of cork, rubber or other suitable material. If desired these filling orifices or connections may be used in emptying the container or as an alternative the inner envelope may in addition have one or more independent discharge openings and these may also be fitted with closing devices, such as rubber tubes or metal or wooden taps, for releasing measured quantities of the contents.

If desired, the above filling and discharge connections or devices may project through the outer cover to permit filling and discharging without removing the inner envelope from the outer cover.

In order that the invention may be more clearly understood description will now be given of one practical example, in conjunction with the accompanying drawing, wherein:—

Figure 1 is a perspective view of the container, the outer cover being opened to show the inner envelope,

Figure 2 is a perspective view of the inner envelope of Figure 1 removed from the outer cover and in folded or empty condition, and

Figure 3 is a similar view of the inner envelope and illustrating its condition when filled and closed.

In Figure 1, the outer cover 1 of the container, of relatively rigid material as exemplified above, is of folding box or carton shape having its ends closed by flaps such as 2 which are shown opened out in the drawing to disclose the inner

envelope 3 which may be of rubber, or other elastic, gas and liquid tight, and, if necessary, acid or alkali resisting, material as aforesaid. This inner envelope is adapted to be filled through a flexible connection 4, such as a rubber tube, which when the container is so filled may be folded or creased, for example, tied with a knot as at 5, to close the envelope. If the end flaps of the outer cover are opened and the inner envelope 3 empty, the whole may be collapsed to a substantially flat condition and this would be the condition in which the container would be stored prior to sale or when not in use. When the container is to be used, the outer cover is erected and one end closed (the bottom end in Figure 1), while the other end, where the connection 4 is, is left open. The inner envelope 3 is then charged with the liquid or other substance with which it is to be filled and this distends or opens out the envelope so that it lies against and is supported by the inner walls of the outer cover 1. The inner envelope when opened out without stretching, as for example by being filled, is of a volume never greater than that of the outer carton. The top flaps 2 are then closed and secured and the charged container is complete. When the contents are to be used, the top flaps 2 are opened, or there may be a perforation for passage of the connection 4, the knot 5 untied and the contents extracted as by tipping the container. Or the inner envelope may be fitted with a tap or other convenient means suitably projecting through the outer cover, for discharge purposes. The construction of the inner envelope 3 is of football-bladder nature that is to say its sides fold to produce flap-like parts 6 lying one on another in the empty condition of the envelope, with the flexible tubular connection 4 extending from one end of the folded or flattened structure, as will be appreciated from Figure 2. The corners of the envelope may be strengthened by corner-pieces 7 and the side edges and ends of the envelope may have reinforcing ribs or cords 8. When filled the envelope expands or opens out to a rectangular shape to fill the outer cover 1 shown approximated in Figure 3 and also apparent from Figure 1. If desired, the upper and lower ends of the envelope may be separate squares or rectangles formed separately from the body portion and secured thereto by adhesive or otherwise, as along the dotted lines at 9 Figure 3 instead of these ends being integral with the body as shown.

Such a container is suitable for storing or receiving various liquids, gases or undivided fluid masses and is simple to

manufacture. Moreover it is leak-proof and there need be no seams or joints which must be rendered fluid tight other than the filling aperture at 4.

- 5 Containers according to the invention have a large variety of applications. They have several advantages over corresponding fully rigid constructions. For example, they are readily collapsible when  
10 empty, are simple to store, and their volume may decrease as the contents are withdrawn. They may be cheaply manufactured by moulding or other processes, and can withstand considerable distortion  
15 without damage. They may prevent the contamination of the contents with rust or metal taste especially when used in place of metal lined cases and they are, in general, lighter than fully rigid containers of corresponding capacity.  
20

Instead of extracting the contents of the container by tipping it may be useful in some circumstances to extract them by compressing the container.

- 25 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

- 30 1. A container suitable for liquids, gases and undivided fluid masses comprising an outer cover and an elastic liquid-tight inner envelope inserted into the outer cover and adapted when filled to lie  
35 against and conform with said outer cover so as to be supported thereby, the said inner envelope and outer cover both being constructed so that they can be folded to a flat and collapsed condition.

- 40 2. A container according to Claim 1, wherein the outer cover is of the nature of

a box or carton made up from blank material which is creased or scored to enable the box or carton to be extended to an erected condition or to be folded to a flat and collapsed condition. 45

3. A container according to Claim 1 or Claim 2, wherein the inner envelope has the form of a bladder of rubber or like elastic material adapted to fold automatically to a flat and collapsed condition similarly to a foot-ball bladder. 50

4. A container according to any one of the preceding Claims, wherein the inner envelope is adapted to be closed independently of the outer cover after filling the container. 55

5. A container according to Claims 3 and 4, wherein the inner envelope has a flexible filling tube like the inflating tube of a foot-ball bladder. 60

6. A container according to Claim 4 or 5, wherein the inner envelope and the outer cover though contained the one within the other, are otherwise disconnected from each other. 65

7. A container according to any one of the preceding Claims, wherein the inner envelope has a filling orifice or connection adapted to be shaped or creased for closing the same. 70

8. A container suitable for liquids, gases or undivided fluid masses constructed substantially as hereinbefore described with reference to the accompanying drawing. 75

Dated this 14th day of February, 1941.

For the Applicants,  
RAWORTH, MOSS & COOK,  
75, Victoria Street, London, S.W.1,  
Chartered Patent Agents.

[This Drawing is a reproduction of the Original on a reduced scale.]

